

U.S. Patent Application No. 10/811,320
Amendment dated September 26, 2007
Reply to Office Action of June 27, 2007

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-18 (canceled)

19. (Currently amended) A coating method using an atomizer which includes a rotary head driven to rotate by a drive source and includes an annular vibration plane located around the rotary head and exerting supersonic vibration forward, the annular vibration plane being inclined forward from its inner circumferential end adjacent to an outer circumferential perimeter of the rotary head, comprising:

supplying a coating material from a material source through a supply passage to the rotary head under rotation;

centrifugally spattering the coating material radially outwardly from the rotary head; and

atomizing the coating material ~~spattered~~ having moved onto the vibration plane from the rotary head ~~radially outwardly~~ by imparting the supersonic vibration from the vibration plane and orienting the coating material forward while the coating material moves radially outwardly along the vibration plane.

20. (Previously presented) The coating method according to claim 19, wherein the coating material centrifugally spattered from the rotary head is oriented forward exclusively by the supersonic vibration without the aid of air.

21. (Previously presented) The coating method according to claim 19, wherein the coating material spattered radially outwardly from the rotary head moves radially outwardly while forming a thin film on the vibration plane.

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22. (Withdrawn) A coating method comprising:

supplying a coating material from a material source through a supply passage to a coating material spattering means;

spattering the coating material forwardly from the spattering means in a condition easy to atomize; and

imparting supersonic vibration oriented toward the axial line of the spattering means oriented diagonally forward toward the axial line of the spattering means to the coating material immediately after spattered from the spattering means from the entire perimeter of the coating material,

wherein the supersonic vibration concentrates to a region where the coating material spattered from the spattering means atomizes.

23. (Withdrawn) The coating method according to claim 22, wherein the coating material is spattered from the spattering means without the aid of atomization air.

24. (Withdrawn) A coating method comprising:

supplying a coating material from a material source through a supply passage to a spattering means;

spattering the coating material outwardly from the spattering means in a condition easy to atomize; and

atomizing the coating material immediately after spattered from the spattering means by imparting supersonic vibration exerted from an annular vibration plane composed of a plurality of segments annularly aligned in the circumferential direction thereof.

25. (Withdrawn) The coating method according to claim 24, wherein the spattering means is a rotary head configured to spatter the coating material radially outwardly.

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26. (Withdrawn) The coating method according to claim 24, wherein the spattering means spatters the coating material forward, and wherein the supersonic vibration is exerted from the vibration plane toward the axial line of the spattering means to concentrate to a region where the coating material spattered from the spattering means atomizes.
27. (Withdrawn) The coating method according to claim 24, wherein the spattering means comprises a material discharge opening for hydraulic atomization of the coating material, and wherein the annular vibration plane is located around the material discharge opening to exert the supersonic vibration diagonally forward therefrom toward a region close to the spattering means.
28. (Withdrawn) An atomizer comprising:
- a material source for supplying a coating material;
 - a rotary head driven to rotate;
 - a supply pipe for guiding a coating material to the rotary head from the material source;
- and
- an annular vibration plane located near and around the outer circumferential perimeter of the rotary head to exert supersonic vibration forward,
- wherein the coating material centrifugally spattered radially outwardly from the rotary head is exposed to the supersonic vibration from the vibration plane while moving along the vibration plane radially outwardly, and thereby atomized and oriented forward.
29. (Withdrawn) The atomizer according to claim 28, wherein the coating material centrifugally spattered from the rotary head is oriented forward exclusively by the supersonic vibration without the aid of air.
30. (Withdrawn) The atomizer according to claim 28, wherein the coating material spattered radially outwardly from the rotary head moves radially outwardly while forming a thin film on

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the vibration plane.

31. (Withdrawn) The atomizer according to claim 28, wherein the annular vibration plane is an inclined plane increased in diameter forward.
32. (Withdrawn) The atomizer according to claim 28, wherein the vibration plane and the rotary head are adjustable in relative position in the front-and-rear direction.
33. (Withdrawn) The atomizer according to claim 28, wherein the annular vibration plane is composed of a plurality of segments annularly aligned in the circumferential direction thereof.
34. (Withdrawn) The atomizer according to claim 28, wherein the atomizer is an electrostatic atomizer for depositing an electrically charged coating material on a work to be coated.
35. (Withdrawn) An atomizer comprising:
- a material source for supplying a coating material;
 - a spattering means for spattering a coating material in a condition easy to atomize;
 - a supply pipe for guiding the coating material from the material source to the spattering means; and
 - an annular vibration plane located to encircle the spattering means and composed of a plurality of segments annularly aligned in the circumferential direction thereof to form an inclined plane gradually increasing the diameter forward from the rear end thereof,
 - wherein the vibration plane exerts and imparts supersonic vibration to the coating material immediately after spattered from the spattering means to atomize it.
36. (Withdrawn) The atomizer according to claim 35, wherein each of the segments is connected to a supersonic generator of its own.
37. (Withdrawn) The atomizer according to claim 35, wherein the spattering means includes a spray nozzle from which the coating material is expelled without the aid of atomization air.

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38. (Withdrawn) The atomizer according to claim 35, wherein the spattering means includes a material discharge opening for hydraulic atomization of the coating material.

39. (Withdrawn) An atomizer comprising:

a material source for supplying a coating material;

a spattering means for spattering the coating material forward in a condition easy to atomize;

a material supply pipe for guiding the coating material from the material source to the spattering means; and

an annular vibration plane located around the spattering means to exert supersonic vibration diagonally forward toward the axial line of the spattering means,

wherein the supersonic vibration concentrates to a region where the coating material spattered forward from the spattering means atomizes.

40. (Withdrawn) The atomizer according to claim 39, wherein the annular vibration plane is composed of a plurality of segments annularly aligned in the circumferential direction thereof.